

# PATENT SPECIFICATION

705,964



Date of Application and filing Complete Specification Nov. 15, 1951.

No. 26788/51.

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Index at acceptance :—Class 22, F2B, F2D(2: X).

## COMPLETE SPECIFICATION

### Improvements in and relating to Cementing or Plastering Compositions

## ERRATA

SPECIFICATION No. 705,964.

Page 1, lines 85 and 87, for "lampback" read "lampblack"

Page 2, lines 25 and 26, after "lampblack" insert "boneblack"

THE PATENT OFFICE,  
10th April, 1954.

25 to either surface of an exterior wall, is sufficiently high to retard transference of heat from the interior to the colder exterior surface of the wall, the temperature of the interior wall surface will not be substantially lower than the room temperature, and condensation trouble will not be experienced.

30 It is to be understood that the expression "cement" as used throughout the specification is intended to include 35 Plaster of Paris, Keene's Cement, lime, Portland cement, mixtures thereof, or any similar material or mixture which is capable of forming a paste with water and of being applied to a wall, floor or similar 40 surface as a coating thereon and of hardening in this condition. The expression cement does not include sand, or similar inherently non-setting material, that may be added to the cement.

45 It is the object of the present invention to avail of the heat insulating properties of carbon to produce a heat insulating cementing or plastering composition by

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dry form consisting of 20 parts cement, 20 parts charcoal, and one part siliceous earth. The charcoal used is vegetable charcoal the purpose of which is to modify the hard setting quality of the ingredients, 75 lighten the weight and in conjunction with the silicious earth to afford a smooth exterior capable of receiving a polish. The property of heat insulation does not arise in this composition. 80

Electric resistance materials, particularly those having a negative-ampere-volt characteristic have been constructed from carbon or fine lampblack mixed with a non-conducting plastic base such as cement, 85 but the quantity of carbon or lampblack used in the composition is considerably less than the quantity of cement in the composition.

It has also been proposed to construct cold storage chambers incorporating 90 bricks, blocks, slabs or concrete composed of a cement made of granulated or powdered cork, charcoal, or other dry non-absorbent and elastic or resilient 95

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## COMPLETE SPECIFICATION

### Improvements in and relating to Cementing or Plastering Compositions

I, PATRICK LEAVY, a Citizen of the Irish Republic, of Curragh Farm, Kildare, Co. Kildare, Irish Republic, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to cementing or plastering compositions such as are used in the building industry and the invention has for its object to provide a composition of cement or plaster which, when applied to walls, floors or other building surfaces, in the form of a cement or plaster coating will have a high heat insulation value and thereby eliminate dampness.

Dampness in houses or other buildings, due to causes other than direct leakage from the exterior to the interior, is largely due to condensation, and it will be apparent that if the thermal insulating value of a cementing or plastering coating applied to either surface of an exterior wall, is sufficiently high to retard transference of heat from the interior to the colder exterior surface of the wall, the temperature of the interior wall surface will not be substantially lower than the room temperature, and condensation trouble will not be experienced.

It is to be understood that the expression "cement" as used throughout the specification is intended to include Plaster of Paris, Keene's Cement, lime, Portland cement, mixtures thereof, or any similar material or mixture which is capable of forming a paste with water and of being applied to a wall, floor or similar surface as a coating thereon and of hardening in this condition. The expression cement does not include sand, or similar inherently non-setting material, that may be added to the cement.

It is the object of the present invention to avail of the heat insulating properties of carbon to produce a heat insulating cementing or plastering composition by

admixing carbon in the amorphous form with the cement in defined proportions. 50

It has heretofore been proposed to use charcoal in cementitious compositions for various purposes other than for heat-insulating purposes, and the proportion of charcoal used in the hitherto known cementitious compositions being not greater than the volume of cement with which it was mixed, the resultant known compositions did not possess any marked heat insulation qualities. 60

Thus it has been proposed to form a porous flower or plant pot from a composition containing charcoal, peat and sand, gravel or limestone, and cement. The charcoal used is poultry small grid free from dust and is not amorphous and its purpose is to prevent or minimise souring of the water in the pot. 65

It has also been proposed to provide a self hardening composition for plastic masses and stucco, the composition in the dry form consisting of 20 parts cement, 20 parts charcoal, and one part siliceous earth. The charcoal used is vegetable charcoal the purpose of which is to modify the hard setting quality of the ingredients, lighten the weight and in conjunction with the silicious earth to afford a smooth exterior capable of receiving a polish. The property of heat insulation does not arise in this composition. 70

Electric resistance materials, particularly those having a negative-ampere-volt characteristic have been constructed from carbon or fine lampblack mixed with a non-conducting plastic base such as cement, but the quantity of carbon or lampblack used in the composition is considerably less than the quantity of cement in the composition. 75

It has also been proposed to construct cold storage chambers incorporating bricks, blocks, slabs or concrete composed of a cement made of granulated or powdered cork, charcoal, or other dry non-absorbent and elastic or resilient 80

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material mixed with a cement. In this proposal the charcoal is intended as a substitute for granulated or powdered cork, and since the material is to be non-absorbent the amorphous variety is hardly contemplated since it is highly absorbent.

The present invention is clearly distinguished from these prior proposals in that the whole object of the invention is to provide a cement or plaster coating for building surfaces which will have marked heat-insulation properties, for which purpose the volume of amorphous carbon used in the composition exceeds the volume of cement in the composition.

Accordingly the present invention, a heat insulating cementing or plastering composition comprises a cement as herein defined to which carbon in the amorphous form is added, the volume of amorphous carbon being greater than the volume of cement in the composition. The added carbon may be in one or more of the forms wood charcoal, animal charcoal, lamp-black, soot, coke carbon, gas carbon, or peat charcoal but for economic reasons it is preferred to add the carbon in the form of charcoal produced from wood or peat.

The heat insulating properties of the cementing or plastering composition according to the invention will be in proportion to the amount of carbon in the composition, but from practical considerations such as time of setting, it is preferred that the composition should comprise 8 parts by volume of charcoal to one to four parts by volume of cement. Sand may be added to the composition.

Typical examples of the cementing or plastering composition which have given excellent results in practice are as follows:—

#### EXAMPLE 1

For interior use, 8 parts charcoal, 2 parts Portland cement, and one part hard setting plaster, the parts being by volume. The hard setting plaster may be a gypsum cement or plaster of the same nature as Plaster of Paris but processed to give a harder finish.

#### EXAMPLE 2

For exterior use, 3 parts charcoal, one part cement, and six parts sand, the parts being by volume.

The addition of the amorphous carbon to the cement, while imparting a remarkably high value of heat insulation to the resultant cement or plaster coating, does not affect the coating adversely in other respects. Thus, carbon being little affected at ordinary temperatures from the point of view of expansion or contraction, the resultant plaster coating does not crack or

chip; it is not flammable, is substantially fire-resistant and possesses both favourable germicidal properties and preserving properties. Moreover, no special skill is required for the application of the composition according to the invention which is, in fact, easier to command than existing cement or plaster compositions. The composition according to the invention will also adhere readily to surfaces which are tarred, sooty or painted without peeling or chipping.

Walls coated with the plastering composition according to the invention may be papered, painted or distempered immediately the plastering composition has set, and no discolouration or injury will be caused to the paper, distemper or paint.

It is to be understood that the cement composition according to the invention can be used on any building surface such as floors, ceilings, and walls.

When employed for plastering the interior surface of a building wall, the cement coating according to the invention may be applied directly to the wall, and a further coating of hard setting plaster as defined above may be applied on top of the first coating.

When applied to the exterior surface of a building wall, the heat insulating coating according to the invention should be protected by a further water-proofing coat of ordinary cement rendering.

It is estimated that charcoal having a carbon content of 75% can be produced economically from wood or peat, 26 to 32% of the wood or peat being obtainable as charcoal suitable for use according to the invention.

What I claim is:—

1. A heat insulating cementing or plastering composition comprising a cement as herein defined to which carbon in the amorphous form is added, the volume of amorphous carbon being greater than the volume of cement in the composition.

2. A heat insulating cementing or plastering composition as claimed in Claim 1, in which the added amorphous carbon is in one or more of the forms wood charcoal, animal charcoal, lamp black, bone black, soot, coke carbon, gas carbon, or peat charcoal.

3. A heat insulating cementing or plastering composition as claimed in Claim 1 or 2, comprising eight parts by volume of charcoal to one to four parts by volume of cement, with or without the addition of sand.

4. A heat-insulating or plastering composition as claimed in Claim 3, comprising eight parts charcoal, two parts Portland cement, and one part hard setting plaster

as herein defined, all parts being by volume.

5. A heat insulating or plastering composition as claimed in Claim 1 or 2, comprising three parts charcoal, one part cement, and six parts sand, all the parts being by volume.

6. A heat insulating cementing or plas-

tering composition substantially as herein described for use in the coating of building surfaces. 10

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